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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/766,035	01/19/2001	Ossi Kalevo	460-010108-US(PAR)	7931

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Clarence A. Green
PERMAN & GREEN, LLP
425 Post Road
Fairfield, CT 06430

EXAMINER

LEE, Y YOUNG

ART UNIT PAPER NUMBER

2613

DATE MAILED: 10/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/766,035

Applicant(s)

KALEVO ET AL.

Examiner

Y. Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-20,22-29,31-35 and 37-57 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 37-40 is/are allowed.
- 6) ☒ Claim(s) 1,2,4-9,11,13-15,19,20,22-27,29,32,33 and 41-57 is/are rejected.
- 7) ☒ Claim(s) 10,12,16-18,28,31,34 and 35 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 September 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>9/16/04</u> . | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/13/04 has been entered.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 2, 4-9, 11, 13-15, 19, 20, 22-27, 29, 32, 33, 42-50, and 52-57 are rejected under 35 U.S.C. 102(a) as being anticipated by Kim et al (A Deblocking Filter

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with Two Separate Modes in Block-Based Video Coding) for the same reasons as set forth in Section 4 of the previous office action, dated 6/27/03.

Re claims 1, 19, 42, 43, 46-50, and 52-57, the method/apparatus or filter or encoder or decoder or terminal for reducing visual artefacts due to a block boundary between image blocks in a frame of a digital video signal reads on Kim et al (Abstract summarizes a method; section III: Experimental Results reveals an apparatus i.e. MPEG-4); comprising performing a filtering operation on the block boundary reads on Kim et al (section II: Proposed Deblocking Filter), that is dependent at least in part on an encoding method used to encode an image block on a first side of the block boundary reads on a region type being defined in section II, part B: Mode Decision (part D: Filtering in the Default Mode. In this segment, block boundary pixels v_4 and v_5 represent pixels of blocks on opposite sides of the block boundary. See Fig. 1), and an encoding method used to encode an image block on a second side of the block boundary reads on Kim et al (section II: Proposed Deblocking Filter and section II, part B: Mode Decision characterized in that the filtering performed on the block boundary depends on one side of the frame in the environment of the block boundary reads on Kim et al (section II: Proposed Deblocking Filter and parts B, C & D).

Claims 2 & 20 recite "...the frame comprises at least one region of image blocks, and the filtering operation performed on the block boundary is dependent at least in part on a region type of an image block on a first side (e.g. S_0) of the block boundary and a region type of an image block on a second side (e.g. S_2) of the block boundary" reads on Kim et al (section II, part B: Mode Decision).

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Claims 4 & 22 recite "...at least one parameter of the filtering operation performed on at least one side of the block boundary is modified in dependence on the encoding method used to encode at least one image block in the environment of the block boundary" reads on Kim et al (section II, parts A-D, Figs. 2 & 4. In these segments, the filtering to reduce artefacts due to a block boundary is modified according the block boundaries in the environment of the region type. In other words, the filtering in Kim et al is adaptive).

Claims 5 & 23 recite "...at least one parameter of the filtering operation performed on the block boundary is modified in dependence on the encoding method used to encode a first image block and the encoding method used to encode a second image block, the first and second image blocks being located on opposite sides of the block boundary" reads on Kim et al (see rejection arguments in claims 4 & 22 above because when a block of pixels are filtered, each and every pixels, including the boundary pixels are filtered).

With respect to claims 6, 24, 44, and 45, Kim et al discloses at least one parameter is selected from a group comprising a number of pixels to be examined (v_0 - v_9), a number of pixels to be filtered (i.e. block), an activity measure providing an indication of the difference between pixel values on one side of the block boundary ($F(v)$), a filtering window S .

Claims 7 and 25 recite "...selecting a number of pixels for examination from at least one side of the block boundary (v_0 - v_4) in dependence on the image content of the

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frame in the environment of the block boundary" reads on Kim et al (section II, parts B-D).

Claims 8 and 26 recite "...the number of pixels selected for examination depends on a difference in pixel value between pixels across the block boundary" reads on Kim et al (Equation F(v)).

Claims 9 and 27 recite "...the number of pixels selected for examination depends on the size of a quantization step used to quantize coefficients used in encoding the image blocks" reads on Kim et al (Fig. 2: "QP" which represents quantization parameter of the macroblock where a boundary pixel belongs).

With respect to claims 11 and 29, Kim et al discloses the number of pixels selected for examination (v_0 - v_9) is first defined according to the image content of the frame in the environment of the block boundary and then truncated in dependence on the encoding method used to encode an image block in the environment of the block boundary to give a truncated number of pixels for examination (v_4 and v_5 only).

With respect to claims 13 and 32, Kim et al discloses selecting certain pixels to be filtered and determining a new value for each pixel to be filtered on the basis of pixels that appear in a filtering window set around the pixel (Fig. 1).

Claim 14 recites "...selecting pixels to be filtered from the pixels selected for examination" reads on Kim et al (Fig. 1. In the Figure, S_0 , S_1 & S_2 represent groups of pixels for examination, and v_4 & v_5 for instance are pixels selected from these groups for filtering).

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With respect to claims 15 and 33, Kim et al discloses the new value of the pixel is the mean value of the pixels that appear in the filtering window (e.g. $QP = |\max - \min|/2$).

5. Claims 1, 2, 4-9, 11, 13-15, 19, 20, 22-27, 29, 32, 33, 42-50, and 52-57 are rejected under 35 U.S.C. 102(b) as being anticipated by Kim (UK 2 329 090).

Re claims 1, 19, 42, 43, 46-50, and 52-57, the method/apparatus or filter or encoder or decoder or terminal for reducing visual artefacts due to a block boundary between image blocks in a frame of a digital video signal (Abstract summarizes a method; Background reveals an apparatus i.e. MPEG-4); comprising performing a filtering operation on the block boundary (411-412), that is dependent at least in part on an encoding method used to encode an image block on a first side of the block boundary reads on a region type being defined in 401-410 (block boundary pixels v_4 and v_5 represent pixels of blocks on opposite sides of the block boundary. See Fig. 2), and an encoding method used to encode an image block on a second side of the block boundary (the filtering performed on the block boundary depends on one side S_1 of the frame in the environment of the block boundary).

Claims 2 & 20 recite "...the frame comprises at least one region of image blocks, and the filtering operation performed on the block boundary is dependent at least in part on a region type of an image block on a first side (e.g. S_1) of the block boundary and a region type of an image block on a second side (e.g. S_2) of the block boundary".

Claims 4 & 22 recite "...at least one parameter of the filtering operation performed on at least one side of the block boundary is modified in dependence on the encoding method used to encode at least one image block in the environment of the block

boundary" (Figs. 2 & 4. In these segments, the filtering to reduce artefacts due to a block boundary is modified according the block boundaries in the environment of the region type. In other words, the filtering is adaptive).

Claims 5 & 23 recite "...at least one parameter of the filtering operation performed on the block boundary is modified in dependence on the encoding method used to encode a first image block and the encoding method used to encode a second image block, the first and second image blocks being located on opposite sides of the block boundary" (see rejection arguments in claims 4 & 22 above because when a block of pixels are filtered, each and every pixels, including the boundary pixels are filtered).

With respect to claims 6, 24, 44, and 45, Kim discloses at least one parameter is selected from a group comprising a number of pixels to be examined (v_0-v_9), a number of pixels to be filtered (i.e. block), an activity measure providing an indication of the difference (d) between pixel values on one side of the block boundary, a filtering window S .

Claims 7 and 25 recite "...selecting a number of pixels for examination from at least one side of the block boundary (v_0-v_4) in dependence on the image content of the frame in the environment of the block boundary" (Fig. 2).

Claims 8 and 26 recite "...the number of pixels selected for examination depends on a difference in pixel value between pixels across the block boundary" (e.g. Eq. for d).

Claims 9 and 27 recite "...the number of pixels selected for examination depends on the size of a quantization step used to quantize coefficients used in encoding the

image blocks" (Fig. 4: "QP" which represents quantization parameter of the macroblock where a boundary pixel belongs).

With respect to claims 11 and 29, Kim discloses the number of pixels selected for examination (v_0 - v_9) is first defined according to the image content of the frame in the environment of the block boundary and then truncated in dependence on the encoding method used to encode an image block in the environment of the block boundary to give a truncated number of pixels for examination (v_4 and v_5 only).

With respect to claims 13 and 32, Kim discloses selecting certain pixels to be filtered and determining a new value for each pixel to be filtered on the basis of pixels that appear in a filtering window set around the pixel (Fig. 2).

Claim 14 recites "...selecting pixels to be filtered from the pixels selected for examination" (Fig. 2. In the Figure, S_0 , S_1 & S_2 represent groups of pixels for examination, and v_4 & v_5 for instance are pixels selected from these groups for filtering).

With respect to claims 15 and 33, Kim discloses the new value of the pixel is the mean value of the pixels that appear in the filtering window (e.g. $QP = |\max - \min|/2$).

6. Claims 1, 2, 4-9, 11, 13-15, 19, 20, 22-27, 29, 32, 33, 42-50, and 52-57 are rejected under 35 U.S.C. 102(e) as being anticipated by Itoh (6,608,865).

Re claims 1, 19, 42, 43, 46-50, and 52-57, the method/apparatus or filter or encoder or decoder or terminal for reducing visual artefacts due to a block boundary between image blocks in a frame of a digital video signal (Figs. 5-15); comprising performing a filtering operation on the block boundary (edge), that is dependent at least in part on an encoding method used to encode an image block on a first side of the

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block boundary reads on a region type being defined in Fig. 4 (block boundary pixels represent pixels of blocks on opposite sides of the block boundary), and an encoding method used to encode an image block on a second side of the block boundary (the filtering performed on the block boundary depends on two sides of the frame in the environment of the block boundary).

Claims 2 & 20 recite "...the frame comprises at least one region of image blocks, and the filtering operation performed on the block boundary is dependent at least in part on a region type of an image block on a first side of the block boundary and a region type of an image block on a second side of the block boundary" (Fig. 7B).

Claims 4 & 22 recite "...at least one parameter of the filtering operation performed on at least one side of the block boundary is modified in dependence on the encoding method used to encode at least one image block in the environment of the block boundary" (Figs. 4, 7, & 14. In these segments, the filtering to reduce artefacts due to a block boundary is modified according the block boundaries in the environment of the region type. In other words, the filtering is adaptive).

Claims 5 & 23 recite "...at least one parameter of the filtering operation performed on the block boundary is modified in dependence on the encoding method used to encode a first image block and the encoding method used to encode a second image block, the first and second image blocks being located on opposite sides of the block boundary" (see rejection arguments in claims 4 & 22 above because when a block of pixels are filtered, each and every pixels, including the boundary pixels are filtered).

With respect to claims 6, 24, 44, and 45, Itoh discloses at least one parameter is selected from a group comprising a number of pixels to be examined (image), a number of pixels to be filtered (i.e. block), an activity measure providing an indication of the difference between pixel values on one side of the block boundary (Formula 6), a filtering window (Fig. 14).

Claims 7 and 25 recite "...selecting a number of pixels for examination from at least one side of the block boundary in dependence on the image content of the frame in the environment of the block boundary" (Fig. 14).

Claims 8 and 26 recite "...the number of pixels selected for examination depends on a difference in pixel value between pixels across the block boundary" (e.g. Formula 6).

Claims 9 and 27 recite "...the number of pixels selected for examination depends on the size of a quantization step used to quantize coefficients used in encoding the image blocks" (14 which represents quantization of the macroblock where a boundary pixel belongs).

With respect to claims 11 and 29, Itoh discloses the number of pixels selected for examination (e.g. block classification) is first defined according to the image content of the frame in the environment of the block boundary and then truncated in dependence on the encoding method used to encode an image block in the environment of the block boundary to give a truncated number of pixels for examination (edge block only).

With respect to claims 13 and 32, Itoh discloses selecting certain pixels to be filtered (Fig. 15) and determining a new value for each pixel to be filtered on the basis of pixels that appear in a filtering window set around the pixel (Fig. 14).

Claim 14 recites "...selecting pixels to be filtered from the pixels selected for examination" (Fig. 2. In the Figure, S_0 , S_1 & S_2 represent groups of pixels for examination, and v_4 & v_5 for instance are pixels selected from these groups for filtering).

With respect to claims 15 and 33, Itoh discloses the new value of the pixel is the mean value of the pixels that appear in the filtering window (e.g. Fig. 15, $(N+1)/2$).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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9. Claims 41 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al for the same reasons as set forth in Section 6 of the previous office action, dated 6/27/03.

Re claims 41 and 51, the technical features as claimed are identical to those of claim 1 except for a storage medium for storing a software program to execute the steps as recited in claim 1. However, it is notoriously well known in the art that MPEG-4 as recited in Kim et al may be implemented by hardware or software or a combination of both. If software implementation is chosen by design, then it is reasonably obvious to conclude that a storage medium for storing a software program to execute the steps as recited in claim 1 is necessitated.

10. Claims 41 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim for the same reasons as set forth in Section 6 of the previous office action, dated 6/27/03.

Re claims 41 and 51, the technical features as claimed are identical to those of claim 1 except for a storage medium for storing a software program to execute the steps as recited in claim 1. However, it is notoriously well known in the art that MPEG-4 as recited in Kim may be implemented by hardware or software or a combination of both. If software implementation is chosen by design, then it is reasonably obvious to conclude that a storage medium for storing a software program to execute the steps as recited in claim 1 is necessitated.

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11. Claims 41 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Itoh for the same reasons as set forth in Section 6 of the previous office action, dated 6/27/03.

Re claims 41 and 51, the technical features as claimed are identical to those of claim 1 except for a storage medium for storing a software program to execute the steps as recited in claim 1. However, it is notoriously well known in the art that MPEG-4 as recited in Itoh may be implemented by hardware or software or a combination of both. If software implementation is chosen by design, then it is reasonably obvious to conclude that a storage medium for storing a software program to execute the steps as recited in claim 1 is necessitated.

Response to Arguments

12. Applicant's arguments filed 9/13/04 have been fully considered but they are not persuasive. Applicant asserts on page 22 of the Remarks that Kim et al fails to disclose that the filtering performed on a block boundary is dependent at least in part on an encoding method used to encode and image block on a first side of the block boundary. However, applicant contradictorily concedes that Kim et al discloses filtering performed on the block boundary is dependent on the encoding method for a flat region (i.e. on the first side of the block boundary).

13. Applicant's arguments with respect to claims 1, 2, 4-9, 11, 13-15, 19-27, 29, 30, 32, 33, 36, and 41-57 have been considered but are moot in view of the new ground(s) of rejection.

Allowable Subject Matter

14. Claims 10, 12, 16-18, 28, 31, 34, and 35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

15. Claims 37-40 are allowed for the same reasons as set forth in Section 7 of the previous office action, dated 6/27/03.

16. As allowable subject matter has been indicated, applicant's reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kim discloses method of removing blocking artifacts in a coding system of a moving picture.

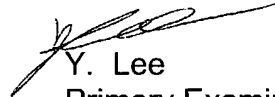
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Y. Lee whose telephone number is (703) 308-7584.

The examiner can normally be reached on (703) 308-7584.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Kelley can be reached on (703) 305-4856. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Y. Lee
Primary Examiner
Art Unit 2613

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